ecology and environment, inc.
International Specialists in the Environment

33 North Dearborn Street
Chicago, Illinois 60602
Tel. 312/578-9243, Fax: 312/578-9345

MEMORANDUM

Date: May 7, 1997

To: John O'Grady
Remedial Project Manager
U.S. Environmental Protection Agency

From: Raghu Nagam
START Project Manager

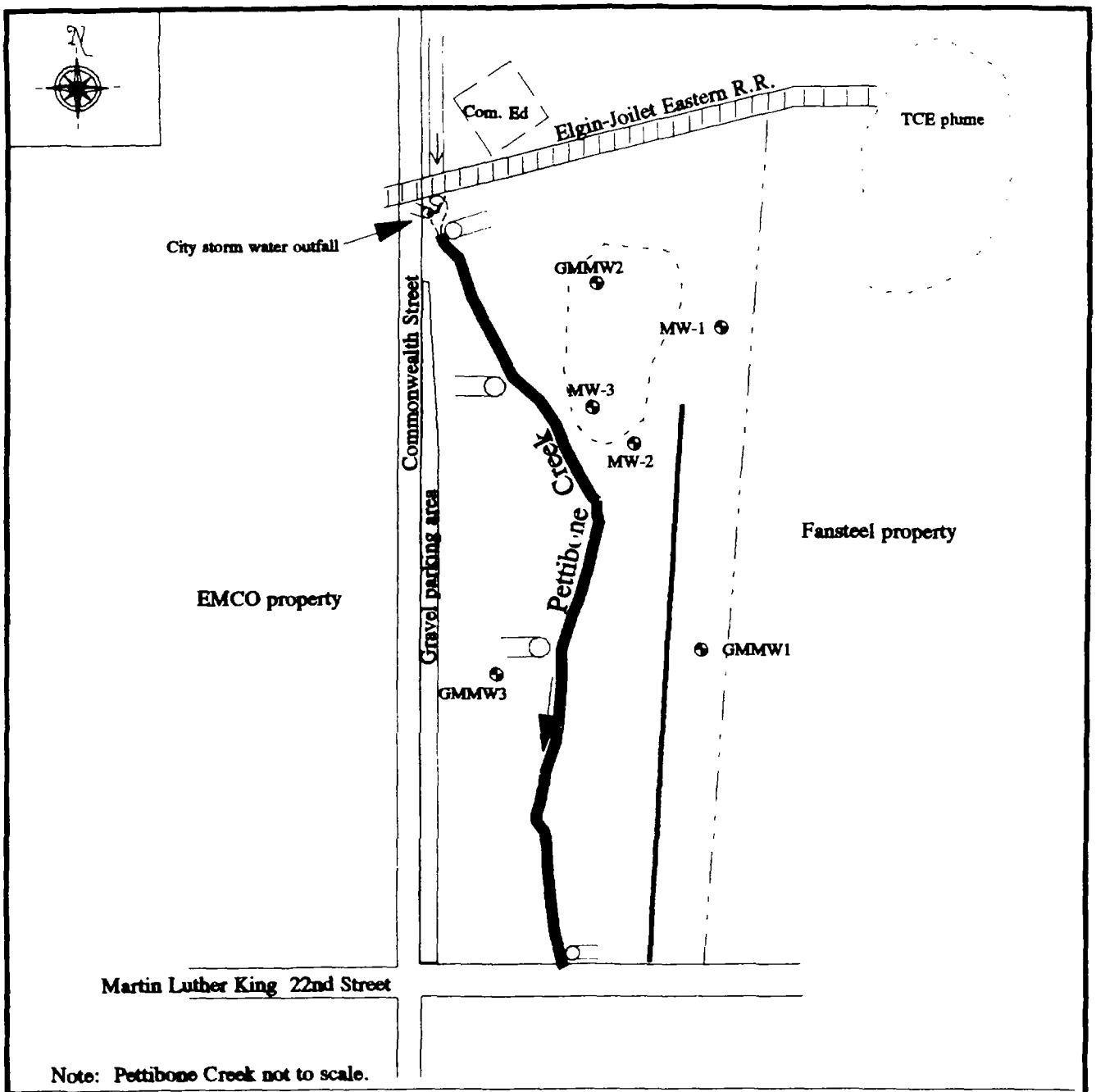
Subject: Update on first sampling event conducted at Vacant Lot Site
TDD#: S05-9609-017
PAN#: 6P1701REXX

xc: Site file

Ecology and Environment, Inc. (E & E), has reviewed the results of the first sampling event conducted in January and February of 1997, at the Vacant Lot site in North Chicago, Illinois. During this sampling period, E & E collected several soil, sediment, and monitoring well groundwater samples. The Geoprobe equipment was used to collect additional groundwater samples around the inside perimeter of the site (Figure1).

Review of the soil and sediment sample results indicate the presence of lead and beryllium metal contamination. Lead concentration above the Agency for Toxic Substances and Disease Registry (ATSDR)-recommended 400 milligrams per kilogram (mg/kg) in residential areas was detected in a majority of samples, while beryllium was detected above the industrial risk-based concentration (RBC) of 1.3 mg/kg in some of the samples. Polynuclear aromatic hydrocarbons (PAHs) are the organics of concern at the site, specifically benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene. Benzo(a)pyrene, which has an RBC of 0.78 mg/kg, was detected in soil samples ranging between 1.3 and 10 mg/kg. Except for one isolated soil sample location, the presence of PAHs can be characterized to be localized to an area where a fire had occurred in the past. This area is approximately 160 feet (ft.) in length and 80 ft. at its widest occurrence. Monitoring wells MW-3 and GMMW-2 are located in this area. Polychlorinated biphenyl (PCB) contamination greater than 50 mg/kg was detected in five soil samples in the fire area. PAHs and lead are also of concern in the sediments present in the Pettibone Creek.

Monitoring well sample results indicate trichloroethene (TCE) and 1,2-dichloroethene (total) above maximum contaminant level (MCL) concentrations in MW-3 and GMMW-2. Vinyl chloride is also present above MCL concentrations in MW-3. The contamination in these two monitoring wells can be attributed to the fill area surrounding them. The four Geoprobe water samples along the eastern perimeter of the site exhibited TCE concentrations ranging from 2 to 5,000 micrograms per



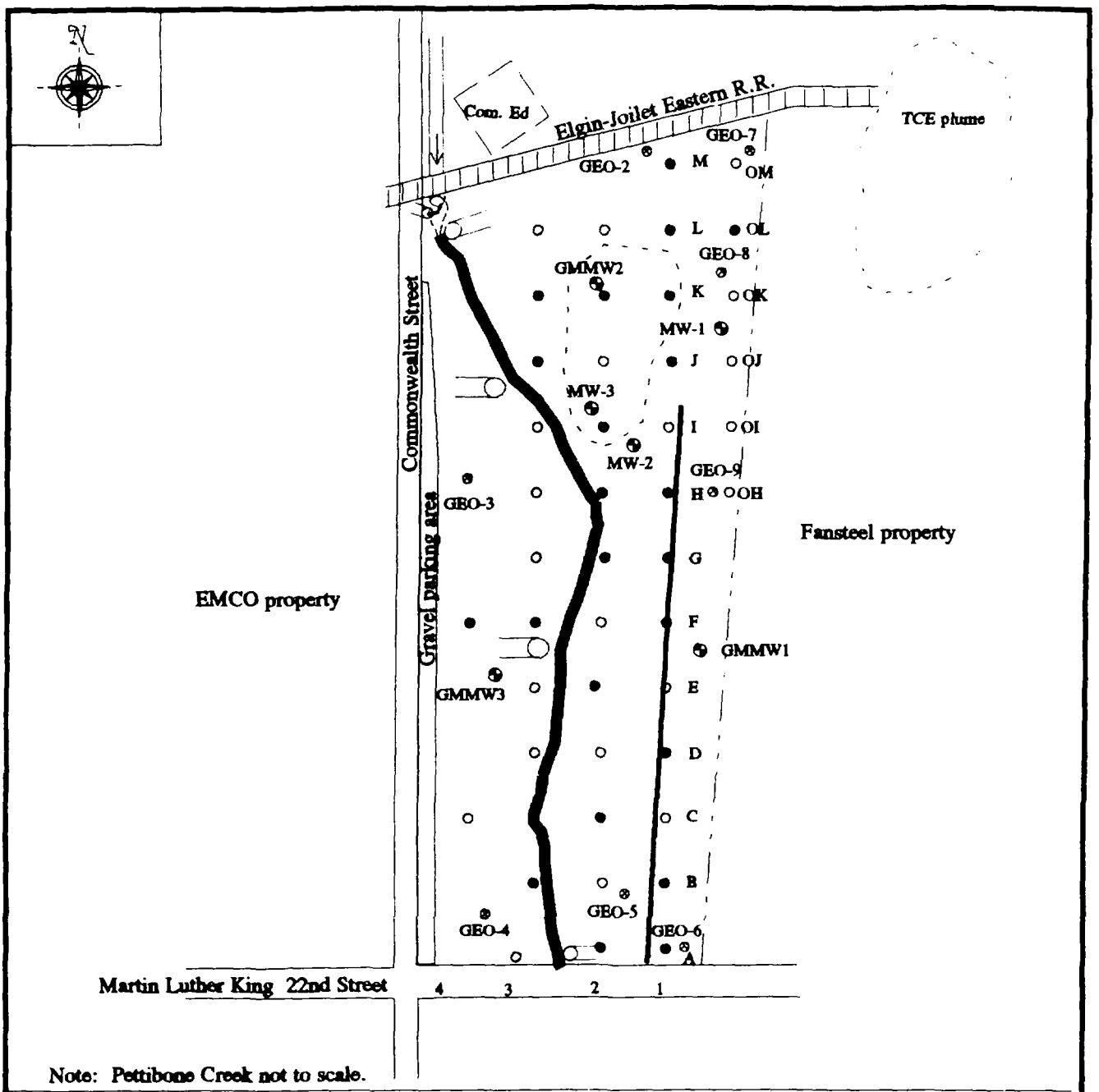
Note: Pettibone Creek not to scale.

Legend

- Outfall
- Monitoring well/number
- Fill area
- Access road
- Fence

ecology and environment, inc.
Superfund Technical Assessment and Response Team
Region 5
33 North Dearborn Street, Suite 900, Chicago, Illinois 60602

TITLE: Site Features Map	FIGURE #: 1
SITE: Vacant Lot	0 100 200 Scale in feet
CITY: North Chicago STATE: Illinois	TDD #: S05-9609-017
SOURCE: Ecology & Environment, Inc.	DATE: 1996 REVISED: 1997



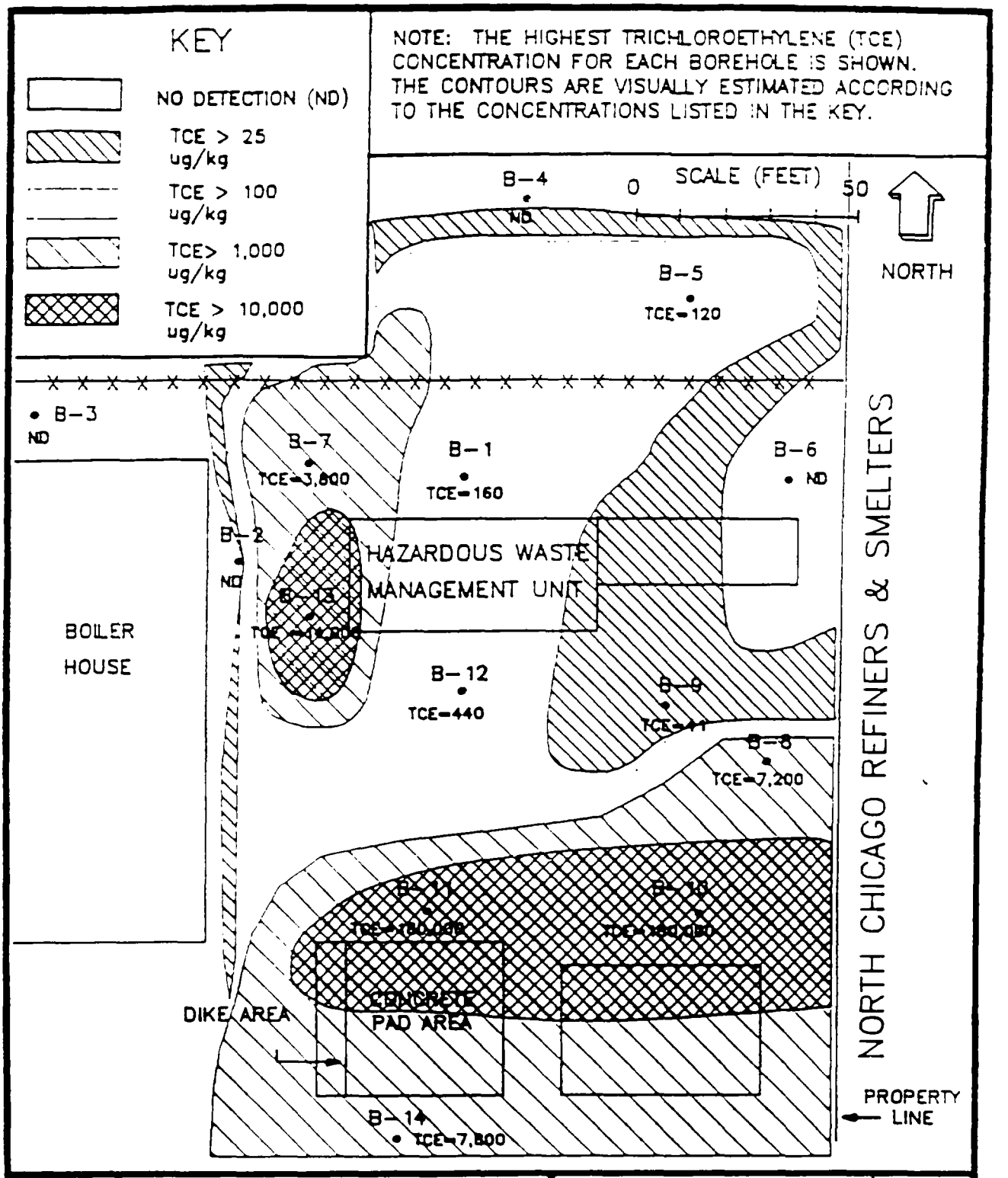
Note: Pettibone Creek not to scale.

Legend

- Outfall
- Monitoring well/number
- Geoprobe location/number
- ○ Soil sample location analyzed for all parameters except VOCs
- ● Soil sample location analyzed for all parameters including VOCs
- Fill area
- Access road
- A 1 Grid node identification
- Fence

ecology and environment, inc.
Superfund Technical Assessment and Response Team
Region 5
33 North Dearborn Street, Suite 900, Chicago, Illinois 60602

TITLE: Sample Location Map	FIGURE #: 2
SITE: Vacant Lot	0 100 200 Scale in feet
CITY: North Chicago STATE: Illinois	TDD #: S05-9609-017
SOURCE: Ecology & Environment, Inc.	DATE: 1996 REVISED: 1997



CARLSON ENVIRONMENTAL, Inc.
312 West Randolph Street
Chicago, Illinois 60606
(312) 346-2140

FIGURE 3
ESTIMATED CONTOUR DIAGRAM
BASED ON TCE CONCENTRATION
PN 8441

liter (μg/L).

A comparison of soil TCE concentrations in the vicinity of the Geoprobe locations indicate the following: Soil sample 1M (100 ft. west of GEO-7) and 1H (40 ft. west of GEO-9) did not exhibit any TCE concentration above the instrument detection level. Soil sample OL-2 (60 ft. north of GEO-8) exhibited a TCE concentration of 190 micrograms per kilogram (μg/kg). Soil sample 1B (80 ft. northwest of GEO-6) exhibited a TCE concentration of 3 μg/kg. Review of the Fansteel facility's background information reveal soil TCE concentrations up to 180 mg/kg (180,000 μg/kg) at depths ranging from the surface to 40 ft. below ground surface. Apart from TCE, perchloroethene (PCE), lead, and cadmium were also present at these depths (Carlson Environmental letter to Illinois Environmental Protection Agency [IEPA] dated January 12, 1993). The available historical information on soil borings pertained only to the northern one-third of the Fansteel facility and contained drawings of known TCE plumes (Figure 2). The GEO-7 sample location (TCE at 420 μg/L) at the northeast boundary of the Vacant Lot site is in close proximity to an identified TCE plume on the Fansteel property, and lies in the potential groundwater migration pathway from the Fansteel facility onto the site. The GEO-8 location (TCE at 180 μg/L) is southwest of another known TCE plume on the Fansteel facility. The local groundwater flow is southwest towards Pettibone Creek. The GEO-6 location (TCE at 5,000 μg/L) at the southeast boundary of the site has the highest TCE concentration detected in on-site groundwater. The nearest soil sample exhibited a TCE concentration of 3 μg/kg at a 2-foot depth. Due to the lack of any identifiable on-site source in the vicinity of this location, this high TCE concentration may be attributed to migrating TCE-contaminated groundwater from a source that might be off site. The background information did not indicate any sampling effort on the southern half of Fansteel facility, directly upgradient from the GEO-6 location.

During our second sampling event at the Vacant Lot site, which was conducted in April 1997, soil boring samples from locations very close to the contaminated Geoprobe sample locations were collected. These results will provide data on the presence of any localized TCE-contaminated soils and will assist in further identifying the source of TCE contribution to groundwater on the site.

If you have any questions, please call me at (312) 578-9243.

Attachments:

1. Site Features Map
2. Sample Location Map
3. TCE Concentration Contours of Fansteel Facility